2011-08-30

Overview, Objectives, and Technical Challenges of the NPS Capability Based Assessments (presentation)

Buettner, Raymond R.

Version 4.0

NAVAL
POSTGRADUATE
SCHOOL

Overview, Objectives, and Technical Challenges of the NPS Capability Based Assessments

Dr. Raymond R. Buettner Jr.

The Nation's Premiere Defense Research University

Monterey, California
WWW.NPS.EDU

Version 4.0

NAVAL
POSTGRADUATE
SCHOOL

Overview, Objectives, and Technical Challenges of the NPS Capability Based Assessments

Dr. Raymond R. Buettner Jr.

The Nation's Premiere Defense Research University

Monterey, California
WWW.NPS.EDU

Version 4.0

NAVAL
POSTGRADUATE
SCHOOL

Field Experimentation
&
Other Stuff

Dr. Raymond R. Buettner Jr.

The Nation's Premiere Defense Research University

Monterey, California
WWW.NPS.EDU

Me

- Director, Field Experimentation
- Associate Professor of Information Sciences
  - Cyber Systems & Operations Academic Committee
  - Chair of Technical Operations (JS J39)
  - Information Warfare Targeting
  - Advanced Influence Modeling
  - New Navy Fighting Machine Concept Development

Me 2

- Principal Investigator
  - JIEDDO (CIED TALE)
  - OSD (P) (SOF Experimentation)
  - OSD DFP
  - NELO (IW Aircraft)
  - CIA (Cyber Metrics)
  - SOCOM J7 (Masters of Technology Integration)
  - SOCOM J7/J9 & SORDAC S&T (TNT)

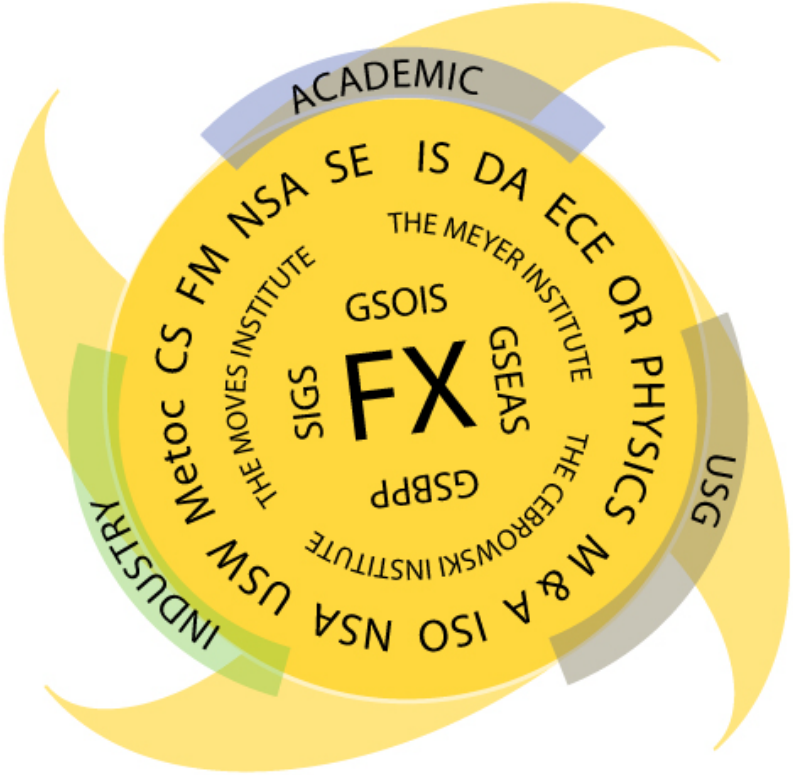
Observations

- ***"This may be the most effective use of taxpayer's dollars in DoD."*** RADL Gary W. Rosholt, Deputy Commanding General, Special Operations Command Central

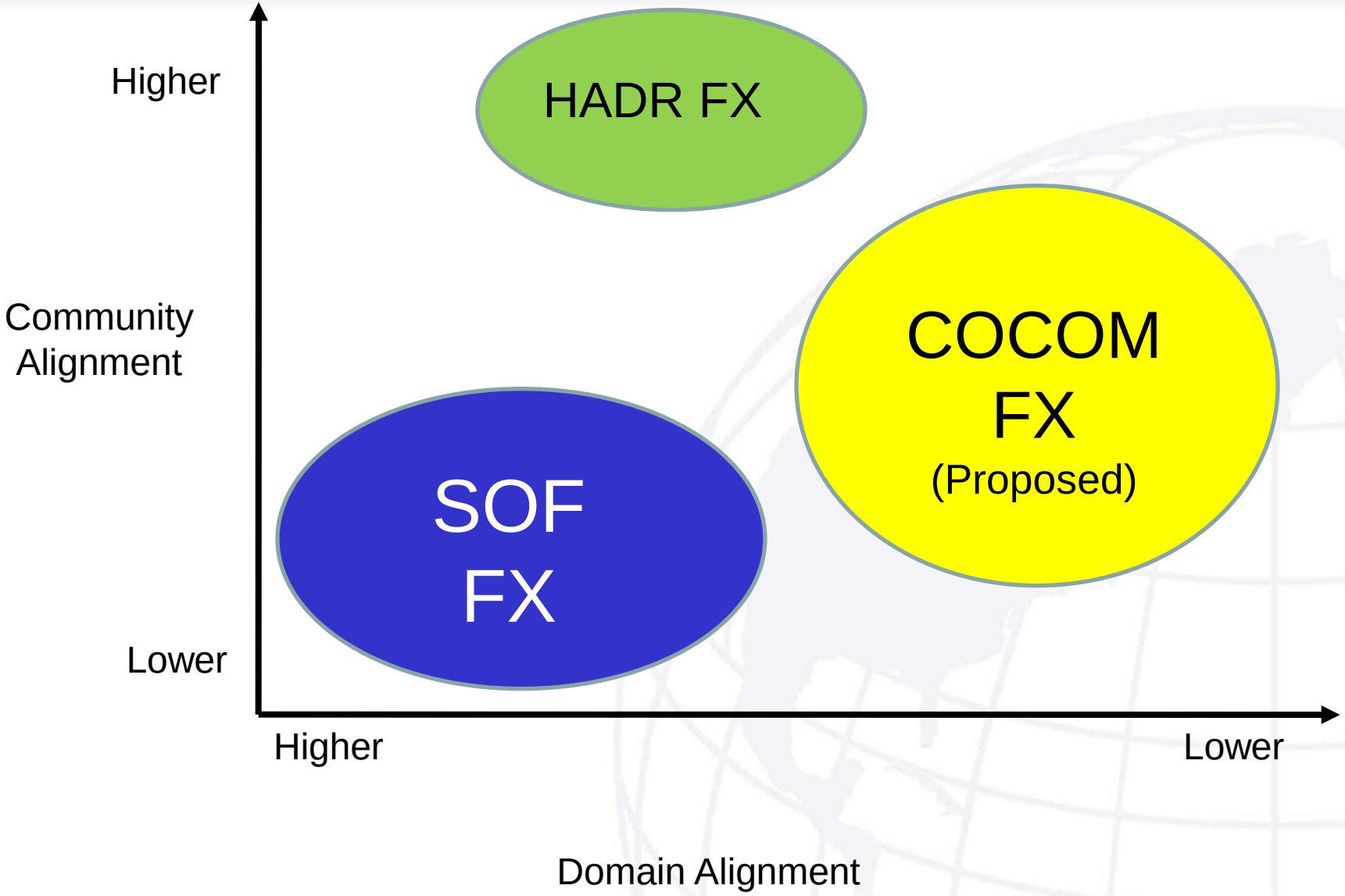
- ***""This morning I was down at Camp Roberts, and I saw a remarkable set of experiments and a remarkable coupling of first-rate research concepts out of NPS, with first-rate users providing feedback on the utility of those concepts and how those could be fielded in future mission sets. I also saw a strong engagement with industry, in particular the small business community. So that's the environment that we really want to start shaping, and you folks are leading the charge on that***." The Honorable Zachary Lemnios, ASD R&E, 9 August 2011

NPS Perspective on FX

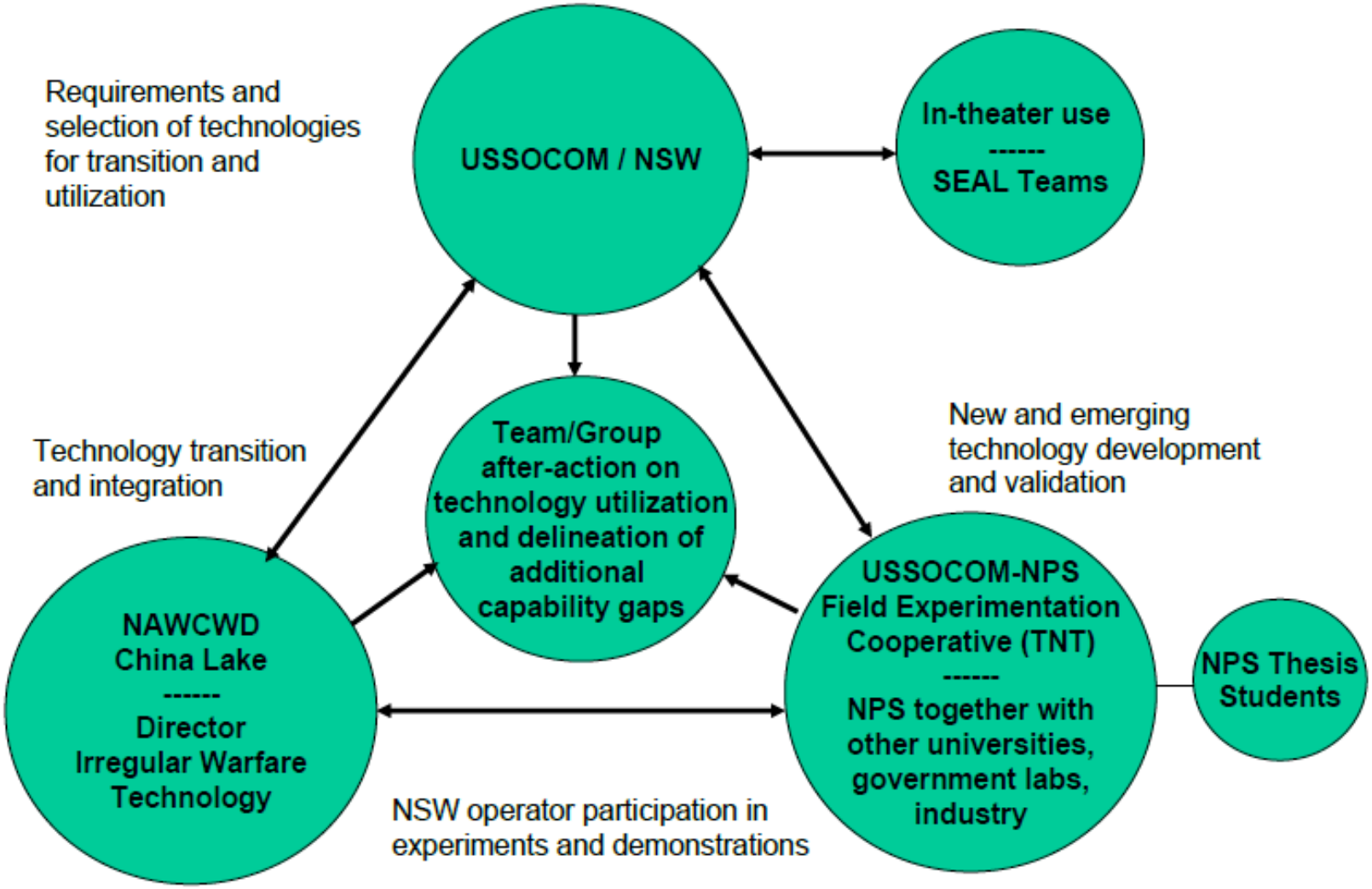
- **Collaborative FX:**
- **Attributes**
  - **Multi-Institutional**
  - **Semi-Structured**
  - **Learning Environment**
- **Addresses**
  - **Problem Domains**
  - **Time to Battlefield**
  - **System of Systems Challenges**
    - **Agile Response**
    - **Test and Evaluation Design**
    - **Concurrent systems evolution**



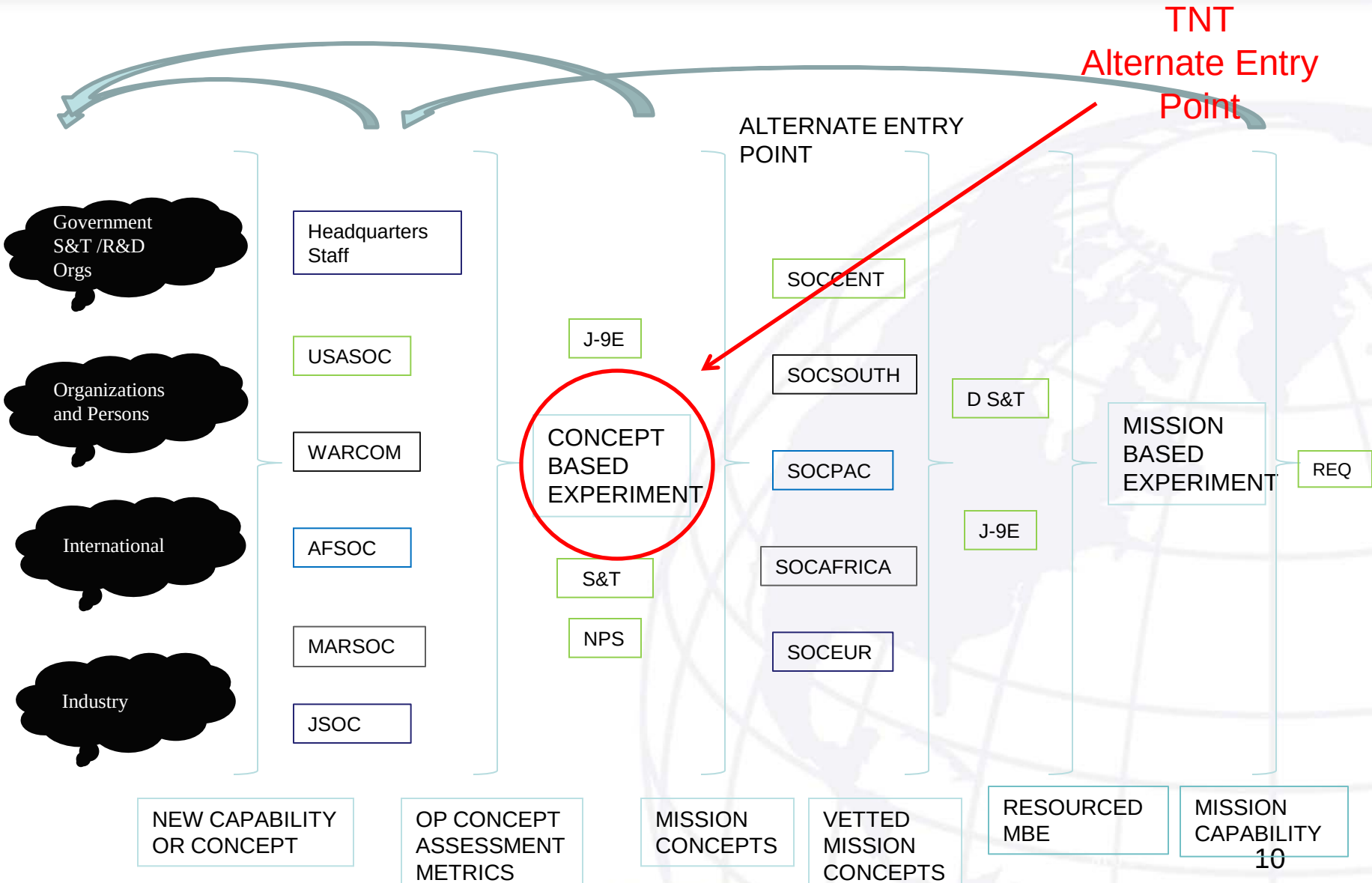
Research Dimensions



NSW View – Pre-Milestone "A"



USSOCOM Perspective



Examples of Impact

Roadmap Influence

- Information Dominance Capability Development Document (CDD)

  Strong play by USASOC and BFC in TNT led to development and approval of this CDD
- Specification requirements for ROVER III (now in service and manufactured by L-3Com)

Transitions to Operational Use

- SNC/INTER-4 Tacticomp and foundations for Tacti-Net
- Redline 802.16 OFDM use by USMC in Iraq and for training at FHL
- Incorporation of AWarE (Advanced Warfighting Environment) into Joint Precision Fires
- SORSE/SOF evaluations and training; Spider, Mini-OPAL, and Camero for TSWG; now deployed forward
- JHU/APL, Mitex, Procerus; launch of Buster UAS with Kestrel autopilot from USN submarine, in theater
- NSA/NSW Firefly Sensor Integration into SIGEAGLE

WARCOM Assessment of Systems

- Boat launch and sea recovery of Aqua Puma UAS for day-night S&R and with boat-shore comms-video link to remote site
- Utilization of L-3Com Rover III/Video Scout with CoT/Bareback and PSS-SOF in close air support (CAS) mission for precision targeting coordinated between F-18 pilot and SOF JTAC using Raven UAS
- Comparison/Assessment of USSMDC AWarE and GD MAAS
- Assessment of through-wall radar (Akela, LLNL)
- X-band SATCOM comms-on-the-move for high speed boat with NSW Group 4
- Proof-of-Concept: Scan Eagle launch and recovery from Mark Vs (Insitu)

- **11-4 TNT Event**
  - **855 participants**
  - **70+ government agencies**
  - **130+ industry organizations**
  - **9 universities**
  - **62 scheduled experiments**
  - **18 adhoc experiments**
- **Government Impact**
  - **Accelerated R&D**
  - **Identification of emergent solutions**
  - **Innovative collaborative research relationships**
- **Civilian Impact**
  - **Multi-company collaboration & new products**
  - **Cyber Security Evaluations**

TNT @ Camp Roberts

Plug & Play Testbed

Specialized Support Systems

Light Reconnaissance Vehicle (LRC)

Developed under an SBIR/CA

All Terrain Vehicles (ATV)

Maintained by NPS, along with other vehicles, to support participants.

Special Operations Research Support Element

USASOC/SOCOM provided special operators to provide SOF Warfighter Assessments as well as less formal feedback to participants.

SURFR


Small Unmanned Radio Frequency Receiver payload integrated with camera for SIGINT queued visual ISR.

Protoypes


Light Squad Automatic Weapon
“Caseless” Ammunition
Light Armor Piercing Round
Ceramic Armor

Energy

Power Systems: Solar, Wind, Fuel Cell, Hybrids are all being examined for both US use as well as partner nation capacity building.

DARPA


Vehicle Bourne Automated Detection System (VBADS)


Co-located Light Attack and Close Air Support Platforms


High Resolution Imagery & Targeting from a Small UAS

Multiple Customers

TICOM GEO 10 YEARS 1998-2008

SIGEAGLE

TNT 9-4 Quick Look Report

"Firefly" Electronic Support Payload Flown on ScanEagle Platform
In support of ANACONDA II and ESSO FIREFLY

Camp Roberts, CA
6-13 May 2009

Special Programs

Midnight Sun – Joint and Interagency Sponsored Classified Thesis

NAVAL
POSTGRADUATE
SCHOOL

RELIEF

Research and Experimentation for Local & International Emergency and First-responders



Information Sharing

Social Media Integration and Crowdsourcing: QuickNets System

QuickNets, a deployable situational awareness kit, will look to expand its software stack to include imagery and mapping.

•Leverage open source software to track reported incidents all the way to completion

•Collaborate with social media monitoring tools to enhance ability to provide a comprehensive common operating picture.

Immediate and Long Term Impact

Explosive Remnants of War Collection Point (ERW-CP)

Using alternative building techniques and materials, ERW-CP explores building small structures, locally, to provide damage mitigation for storing unexploded ordinance in conflict and post-conflict environments.

In addition to contributing to deployed US forces and strategic partner countries ability to deal with ERWs locally, the ERW-CP provides locals with construction methods that leverage locally available materials to provide structures that have superior resistance to explosions and fragmentation.

Policy and Procedure

Sharing Imagery Between National Geospatial-Intelligence Agency (NGA) and the Volunteer Technical Community (VTC)

In order to make the extensive knowledge and image resources available to the NGA available to the larger disaster response community, representatives from NGA and the open source disaster mapping community are meetings at RELIEF in August to discuss:

The legal, policy, and licensing issues associated with sharing unclassified commercial imagery with the VTC within the context of an international and domestic disaster scenario.

•The technical interoperability aspects for the rapid delivery of unclassified, high-resolution imagery and NGA derived damage assessment polygons. The technical objectives include:

- acquisition of VTC-derived near real-time reporting and data updates
- creation of a secure work environment that will enhance collaboration with the VTC.

Coming Soon

To a Field Venue Near You

Joint-Interagency Field Experimentation

COCOM Focused Experimentation

- **4 Distinct Annual Experiments**
  - Each COCOM has its own RFI
  - COCOM S&T Entities work with NPS to select experiments based on COCOM challenges
  - NPS handles coordination and logistics
  - 200+ planned experiments annually
  - Rotate theme selection among COCOMs
  - OSD provides baseline funding to NPS
- **Government Impact**
  - Accelerated R&D exploration and discovery
  - Identification of emergent solutions
  - Innovative collaborative research relationships
- **Civilian Impact**
  - Multi-company collaboration & new products
  - Cyber Security Evaluations

Irritating Statements

We have to eliminate redundancy.

We need to consolidate our efforts.

We need to add rigor to the process.

No one has failed their way to success.

How to play

- NPS
  - Send Email
  - CRADA
  - Grants
- TNT, RELIEF or CFX
  - RFI
  - Submit a white paper
  - Register to attend
  - Come on out

Additional Information

Contact
Dr. Ray Buettner
buettner@nps.edu
buettner@nps.navy.smil.mil
831 656 3387 DSN 756-3387

TNT - USSOCOM SORDAC S&T Experimentation Website

RELIEF – Google NPS RELIEF Camp Roberts

Acknowledgements: Tuomi, Ilkka, Data is More Than Knowledge Implications of the Reversed Knowledge Hierarchy for Knowledge Management and Organizational Memory, *Journal of Management Information Systems / Fall 1999, Vol. 16, No. 3., pp 107-121*